

New physics search via CP observables in $B_s^0 \rightarrow \phi\phi$ decays with left- and right-handed Chromomagnetic operators (10'+3')

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In this work, we investigate the time-dependent angular analysis of $B_s^0 \rightarrow \phi\phi$ decay to search for new physics signals via CP-violating observables. We work with a new physics Hamiltonian containing both left- and right-handed Chromomagnetic dipole operators. The hierarchy of the helicity amplitudes in this model gives us a new scheme of experimental search, which is different from the ones LHCb has used in its analysis. To illustrate this new scheme, we perform a sensitivity study using two pseudo datasets generated using LHCb's measured values. We find the sensitivity of CP-violating observables to be of the order of 5 – 7% with the current LHCb statistics. Moreover, we show that Belle(II)'s $B_d^0 \rightarrow \phi K_s$ and LHCb's $B_s^0 \rightarrow \phi\phi$ measurements could be coupled within our model to obtain the chirality of the new physics.

Auteurs principaux: KOU, Emi (LAL); KAPOOR, Tejhas (IJCLab)

Orateur: KAPOOR, Tejhas (IJCLab)